Space Weather Forecast

Issued on Wednesday, 04 October 2023 at 13:09 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-flares throughout. Slight chance of isolated Minor Storm intervals on day 3(6th Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low, with only low level Common class flares observed. There are currently eight sunspot regions on the visible disc, the largest being a moderately complex, medium sized region in the northeast. However, a smaller region in the southwest generated the majority of the larger common class flares, despite showing a slight decay in area. Most of the regions on the disc showed only small changes, these generally in a state of slow decay, although new, simple regions emerged in the southeast and southwest.

No new Earth-directed Coronal Mass Ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: Solar wind speeds were at background levels, generally between 340-380 km/s. The strength of the magnetic field was largely weak, but increased through the evening of 03 Oct to reach predominantly moderate levels. The important north-south component, fluctuated weakly between north and south. Geomagnetic activity was Quiet to Unsettled (Kp2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: After some reanalysis, a fairly slow CME from 02 Oct in the vicinity of a sunspot currently located in the southwest disc has been assessed as being Earth-directed, with an expected arrival early on day 3 (06 Oct). Otherwise, no other CMEs feature in the forecast. The fast wind associated with an equatorial coronal hole has still not manifested at Earth. It now appears unlikely to connect significantly, meaning that largely background winds are expected through the period, with no significant high-speed stream enhancements forecast.

Mainly Quiet geomagnetic activity is expected with isolated Unsettled intervals through days 1 and 2 (04 and 05 Oct), with just a slight chance of Active conditions. Activity should increase to become mainly Unsettled or Active during day 3 (06 Oct) following the arrival of the aforementioned CME from 02 Oct. There is a slight chance of G1 Minor Storm conditions occurring with this feature. Activity likely reducing to Quiet to Unsettled levels again on day 4 (07 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background levels, with no Solar Radiation storms expected.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	15	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	2	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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